

European Patent Application  
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PG03-012EP  
P27882EP

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### Claims

1. Method for modifying a reproduction of a music file according to a transmission  
characteristic of a loudspeaker of a mobile terminal of a wireless communication  
system with steps for  
- identifying audio data in the music file which represent a sound with a spectral  
component below the transmission frequency range of the loudspeaker,  
- modifying a reproduction of sound from the identified audio data such, that the  
modified reproduction yields a sound spectrum having an increased energy  
content within the transmission frequency range of the loudspeaker as  
compared to sound obtained by an unmodified reproduction.
2. Method according to claim 1,  
characterised in  
that the modified reproduction of sound is based on a modified parameter file.
3. Method according to claim 1,  
characterised in  
that the modified reproduction of sound is based on a modified FM-spectra file.
4. Method according to claim 1, 2 or 3;  
characterised in  
that the modified reproduction of sound is based on swapping a specification  
given in the music file for the instrument used to reproduce sound from the  
identified audio data by a substitute specification of an instrument with brighter  
timbre.
5. Method according to claim 4,  
characterised in  
that the instrument of the substitute specification belongs to the same category of  
instruments as the originally specified instrument.
6. Method according to claim 4 or 5,  
characterised in

that if more than one substitute specification is available for being swapped with an original specification in the music file, the substitute specification is selected based on the register in which the originally specified instrument is to be replayed.

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7. Method according to one of the claims 1 to 6, characterised in that the modified reproduction of sound is based on a transposition of a sound spectrum to a higher frequency range.

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8. Method according to claim 7, characterised in that the transposition shifts the sound spectrum such, that the lower end of the sound spectrum is located within the transmission range of the loudspeaker.

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9. Method according to claim 8, characterised in that the main energy content of the transposed sound spectrum is located within a frequency range from 5 kHz to 10 kHz.

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10. Method according to one of the claims 1 to 9, characterised in that the format of the music file corresponds to a MIDI data file format.

- 25 11. Apparatus for rendering sampled data from a music file according to a transmission characteristic of a loudspeaker of a mobile terminal of a wireless communication system, the apparatus (100) comprising:

- storage means (101) for storing the music file and data related to the transmission characteristic of one or more loudspeaker,
- 30 - selection means (102) for selecting data for a particular loudspeaker from the storage means,
- low frequency sound identification means (103) for identifying audio data in the music file which represent a sound with a spectral component below the transmission frequency range of a loudspeaker according to the selected data,
- 35 - control means (104) for controlling a modification of a reproduction of sound from the identified audio data such, that the modified reproduction yields a sound spectrum having an increased energy content within the transmission frequency range of the loudspeaker as compared to sound obtained by an unmodified reproduction, and

synthesising means (105) for synthesising sampled data from the modified music score.

12. Apparatus according to claim 11,  
5 characterised in  
that the control means (104) modifies the reproduction of a music file according to a method of one of the claims 1 to 9.
13. Apparatus according to claim 11 or 12,  
10 characterised in  
that the control means (104) is adapted to store audio data representing a sound obtained by a modified reproduction in a music file in a storage means (101) of the apparatus (100).
14. Apparatus according to one of the claims 11 to 13,  
15 characterised in  
that the control means (104) is adapted to modify the reproduction of sound at the time the respective music file is replayed via the loudspeaker.
15. Mobile terminal for use with a wireless communication system and adapted to reproduce audio data from a music file, the mobile terminal comprising  
20 - an apparatus (100) for rendering sampled data from the music file according to one of the claims 10 to 14,  
- a transformation means for transforming the sampled data obtained from the  
25 apparatus (100) into a respective analogue electrical signal, and  
- a loudspeaker for converting the analogue electrical signal into a respective sound signal.
16. Software product comprising a series of state elements which are adapted to be  
30 processed by a data processing means of a mobile terminal such, that a method according to one of the claims 1 to 9 may be executed thereon.